IMPACT OF INTER - LATA RESTRICTIONS

SYSTEMS INTEGRATION OPPORTUNITY

INPUT

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PRELIMINARY ASSESSMENT OF THE IMPACT OF INTER-LATA RESTRICTIONS ON BELL ATLANTIC'S SYSTEMS INTEGRATION OPPORTUNITY

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Exhibits

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A

Scope

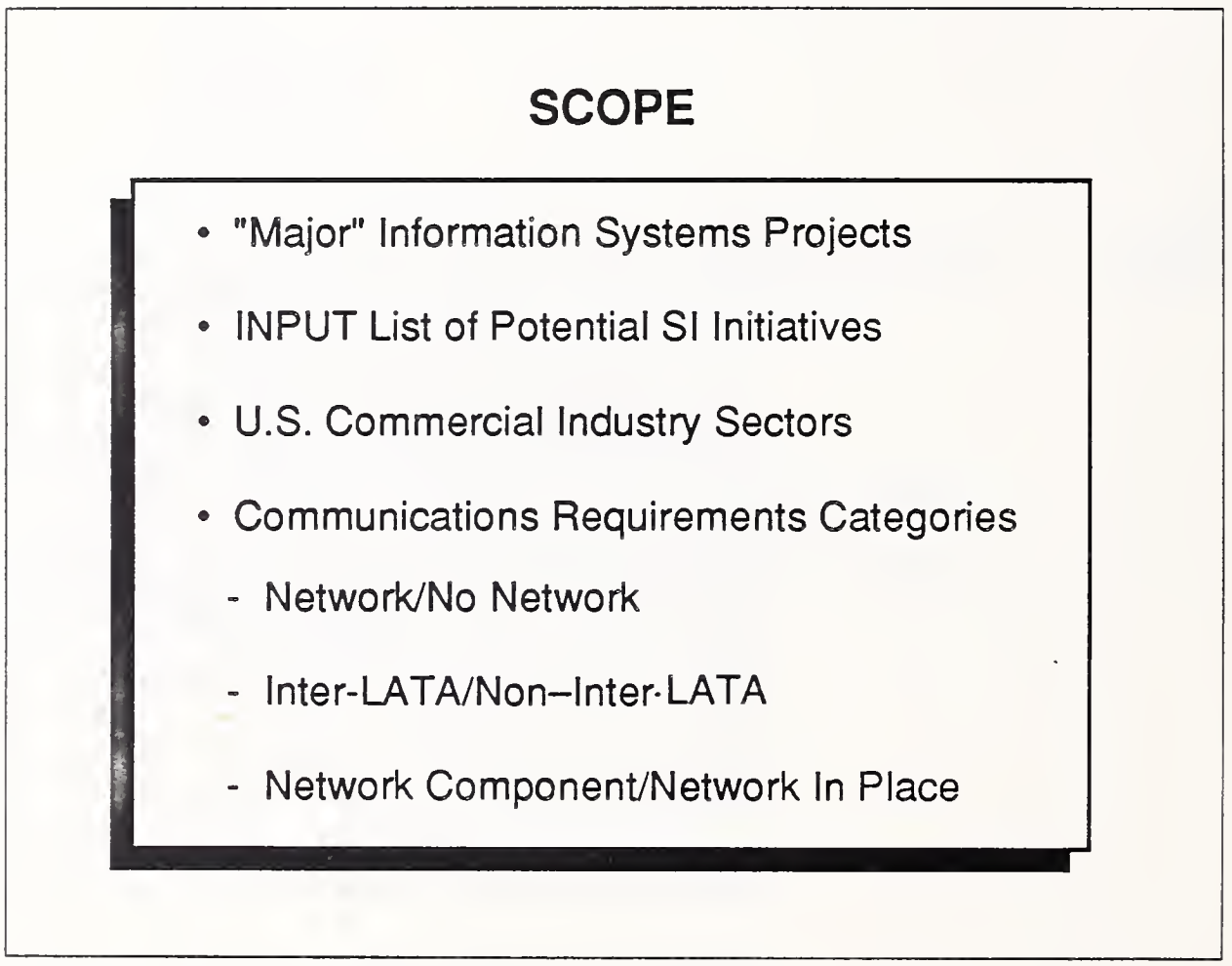
This project entails a preliminary assessment of the systems integration marketplace. Specifically, the issue is the extent to which any regulatory restrictions that have been or may be placed on Bell Atlantic with respect to the provision of inter-LATA services prohibits the company from portions of the systems integration marketplace.

This study is restricted in that INPUT analyzed only major information systems projects. The first cut at the definition of "major" was up to the interviewees. That is, INPUT asked them to identify major development efforts that they had completed in the last year, planned within the next year, or have currently under way. INPUT then qualified these jobs with respect to such issues as dollar size, the extent to which the project was being completed by external contractors, and the extent to which the project involved a data processing component. Only those jobs that were of a data processing orientation were included in this study.

The study is further restricted in that the projects that were pursued for the study came from leads that were known to INPUT at the outset of the study. All of these leads were within the United States commercial industrial sectors. For the purposes of this study, commercial includes state and local governments.

Although all projects that could legitimately be classified as a systems integration project were included, care was taken to classify these projects with respect to their communication requirements. We first classified projects in terms of whether there was a network requirement for those jobs with a wide network requirement. We then further classified those jobs as to whether the network was inter- or intra-LATA. Finally, for inter-networks, we assessed whether the network was in place or whether the development of the network was a component of the total project.

EXHIBIT 1



B

Methodology

A questionnaire targeting questions of interest to Bell Atlantic was prepared and reviewed by Bell Atlantic. Changes requested by Bell Atlantic were made.

Concurrently INPUT accumulated all known information on potential projects. By telephone INPUT attempted to identify knowledgeable representatives with respect to the individual projects. When a knowledgeable representative had been identified, an interview was conducted. At this point, no attempt was made to qualify the project with respect to being a systems integration job or having a communications requirement. That process occurred after all of the interview data was collected on each project. The data was tabulated with respect to the communications requirement and analyzed. Then a forecast was prepared and a final report generated.

EXHIBIT 2

METHODOLOGY

- Prepare Questionnaire and Revise per Bell Atlantic Request
- Accumulate Known Information on Potential Projects
- Interview, via Telephone, Company Representative
- Categorize Projects vis-a-vis Communications Requirements
- Tabulate Data
- Analyze Data
- Prepare Forecast by Communications Category
- Prepare Report

C

Data Base

A total of 190 projects formed the basis of INPUT's preliminary list of contacts. At the conclusion of this study, 109 interviews had been conducted. Of these interviews, 44 projects were detailed. Twenty-four of these 44 were disqualified. The disqualifications were primarily the result of INPUT's judgment that the project was being completed in-house, was of a transport only nature, or was not a project meeting INPUT's definition of systems integration. Twenty projects fell through these screens and are included in this study.

EXHIBIT 3

DATA BASE

- 190 Potential Projects on INPUT's List
- 109 Interviews Conducted
- 44 Projects Detailed
- 24 Projects Disqualified
- 20 Projects considered in Data Analysis

D

Major Projects Included in Data Base

INPUT believes that the projects included form a representative sample of typical projects within the systems integration marketplace. As may be seen in Exhibits 4a and 4b, the project expenditures range from a low of one-half million dollars to a high of two hundred million dollars.

Several industries are represented in the list, and numerous systems integration vendors are present.

EXHIBIT 4a

MAJOR PROJECTS INCLUDED IN DATA BASE

Target Application	Industry	SI Vendor	Total Project Expenditures ($M)	Project Duration (Months)	Status
Electronic Tandem Network	State Government	C&P Telephone	4M	3 Months	Completed 9/87
Network	Distribution	in-house/ MICOM	6M	36 Months	In Progress
Warehouse of the Future	Manufac-turing	Harnisch-fager	7.5M	36 Months	Completed 1/87
SDN	Manufac-turing	AT&T	Ref.	ongoing	In Progress
ISDN	Distribution	Ill. Bell	1M	9 Months	In Progress
Banking	Banking	IBM	25M	36 Months	In Progress
V/D Integration	State Government	AT&T	200M	120 Months	In Progress
Regionalize MIS Function	Manufac-turing	in bidding process	3-5M	24 Months	New Project
Billing System	Utilities	EDS	11M	24 Months	In Progress
Accounting Support	Insurance	AA	DK	36-48 Months	In Progress
Student Information	Higher Education	Coopers & Lybrand	10M	36 Months	In Progress
Lease Management Data Base	Process Manufacturing	Big 8 Accounting Firm	20M+	36 Months	Completed

EXHIBIT 4b

MAJOR PROJECTS INCLUDED IN DATA BASE

Target Application	Industry	SI Vendor	Project Expenditures ($M)	Project Duration (Months)	Status
Inventory Management	Distribution	Arthur Young	Ref.	48+ Months	In Progress
Office Automation	Services	Systemhouse	1.2M	17 Months	In Progress
Data Communication Network	State Government	BCS	20-23M	72 Months	Completed
Automated Crew Calling	Transportation	PST	0.5M	24 Months	In Progress
Data Center Consolidation	Manufacturing	CTG	25M	24 Months	In Progress
Data Base Management Installation	Process Manufacturing	Arthur Andersen	10M	48 Months	In Progress
Customer Information System	Finance	EDS	50M	60 Months	In Progress
Laboratory Information System	Health Care	LabForce	2.2M	36 Months	In Progress

E

Communications Requirement Categories

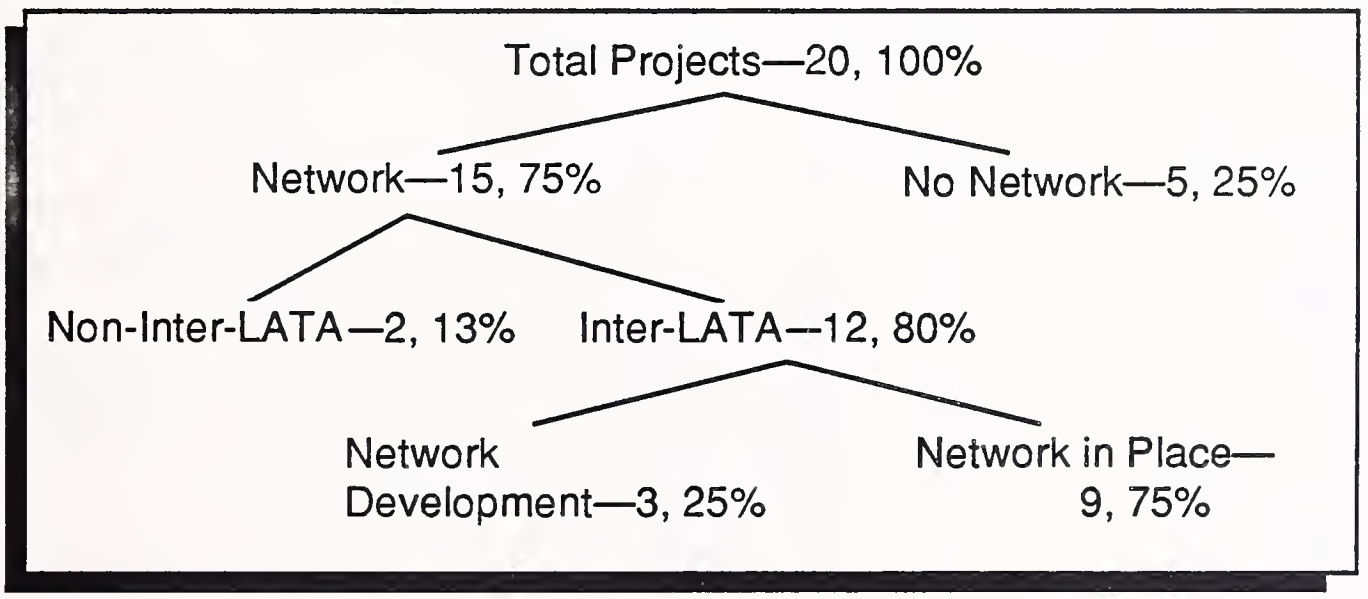
All communications categories defined at the outset of the study are included within the 20 projects. It is to be noted that 75% of these projects included a network and that, for those network projects, 80% were inter-LATA. However, in Bell Atlantic's interest, the data indicates that some 75% of these inter-LATA networks are already in place.

It would appear then, that although a network is generally required and that the network is generally of an inter-LATA nature, much of this work has previously been completed. It seems reasonable to assume that any decision regarding a long-distance carrier was previously made and that this requirement for an SI vendor would no longer be an issue.

In approximately 75% of these in-place networks, there is the possibility that the integrator would have to interface to the existing network, as shown in Exhibit 5.

EXHIBIT 5

COMMUNICATIONS REQUIREMENT CATEGORIES



* Note: Transport area is not known on one project.

F

Target Applications by Communications Category

Exhibits 6a and 6b detail, first, the network requirements by the project; second, the inter-LATA requirements for these projects; and third, for those networks that are inter-LATA, the current status of the development of that network.

EXHIBIT 6a

TARGET APPLICATIONS BY COMMUNICATIONS CATEGORY

Target Application	Network		Inter-LATA		Inter-LATA Network Status	
	No #	Yes #	Yes #	No #	In Place #	To Be Developed #
Electronic Tandem Network		1		1		
Network		1	1			1
Warehouse of the Future	1					
SDN		1	1		1	
ISDN	1					
Banking		1		1		
V/D Integration		1	1		1	
Regionalize MIS Function		1	1			1
Billing System	1					
Accounting Support		1	DK			
Student Information	1					
Lease Management Data Base		1	1		1	

EXHIBIT 6b

TARGET APPLICATIONS BY COMMUNICATIONS CATEGORY

Target Application	Network		Inter-LATA		Inter-LATA Network Status	
	No #	Yes #	Yes #	No #	In Place #	To Be Developed #
Inventory Management		1	1		1	
Office Automation	1					
Data Communications Network		1	1			1
Auto Crew Calling		1	1		1	
Data Center Consolidation		1	1		1	
Data Base Management Installation		1	1		1	
Customer Information System		1	1		1	
Laboratory Information System		1	1		1	

G

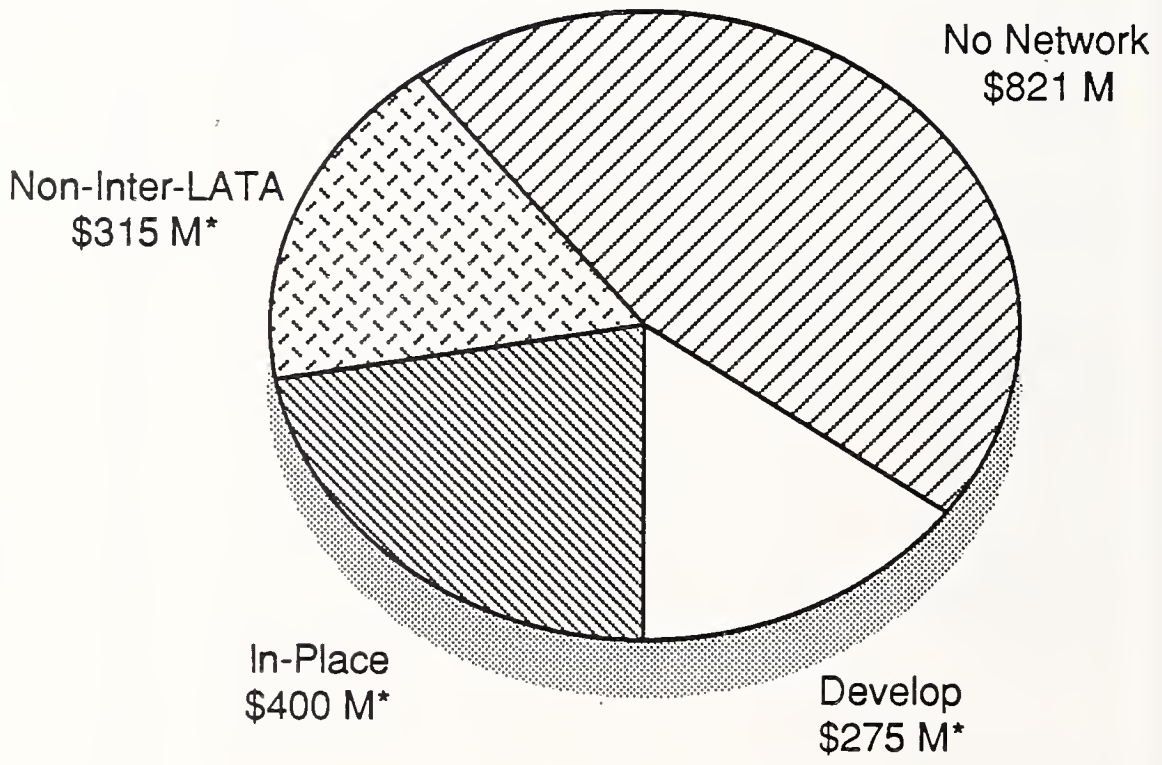
Market Expenditures by Communications Category

INPUT estimates that approximately 55% of the expenditures for systems integration projects involve a network requirement. INPUT further estimates that for those projects requiring a network, some 68% of the expenditures for systems integration projects have an associated inter-LATA requirement. Although these projects have an inter-LATA requirement, as noted earlier, much of this work has been completed and the associated long-distance carrier decision has been made.

On the assumption that the long-distance carrier decision for networks that are in place has been made, INPUT estimates that jobs that require such a decision involve only those projects for which that decision has yet to be made. Accordingly, INPUT estimates that the avoidance of any inter-LATA restrictions on the part of Bell Atlantic would extract just $275 million from this total 1987 market of $1.8 billion. This calculation represents just 15% of the total market that may need to be avoided by Bell Atlantic. Details are in Exhibit 7.

EXHIBIT 7

MARKET EXPENDITURES BY COMMUNICATONS CATEGORY, 1987



Total Market
$1,811 M

* Total Revenues for projects with some network involvement.

H

Communications Requirements

Exhibits 8a and 8b detail the hardware and/or services requirements relating to communications for the projects included in this study. Eleven of these projects include one or both requirements. Again, the indication is that there are significant opportunities for Bell Atlantic to market their communications expertise in the systems integration marketplace.

EXHIBIT 8a

COMMUNICATIONS REQUIREMENTS

Target Application		Communications Hardware	Communications Services
Electronic Tandem Network		Yes	Yes
Network	Yes	Yes	
Warehouse of the Future		No	No
SDN	No	Yes	
ISDN	No	Yes	
Banking	No	No	
V/D Integration		No	No
Regionalize MIS Function		Yes	Yes
Billing System		No	No
Accounting Support		DK	DK
Student Information		DK	DK
Lease Management Data Base		DK	DK
Inventory Management		No	No
Office Automation		Yes	Yes

EXHIBIT 8b

COMMUNICATIONS REQUIREMENTS

Target Application	Communications Hardware	Communications Services
Data Communications Network	Yes	Yes
Auto Crew Calling	No	Yes
Data Center Consolidation	No	No
Data Base Management Installation	Yes	Yes
Customer Information System	Yes	Yes
Laboratory Information System	Yes	Yes

I

Long-Distance Carrier Selection Decision Makers

Eight of the twenty projects included in this study involve a long-distance carrier decision to be completed sometime during the course of the project. In only two instances was the decision maker outside of the traditional data processing environment. This suggests that Bell Atlantic's traditional clients will continue to have a data processing orientation even within the systems integration marketplace.

Respondents, in all instances, identified the decision maker as the key influencer of this carrier decision. It may have been the case that respondents were simply pointing out the key influencer of the decision without identifying other participants in that decision. (Exhibit 9.)

EXHIBIT 9

LONG-DISTANCE CARRIER SELECTION

Title	Frequency of Mention #	Frequency of Key Influence #
Commissioner of Fin. & Admin.	1	1
Sr. Mgmt. (MIS Group)	2	2
Mgr. Corp. Telecom	1	1
VP Corp. Systems	1	1
Corp. Officers	1	1
Director of Technology	1	1
Project Leader	1	1

J

Preference for Class of Vendors

Interviewees were provided with a list of classes of vendors as follows: computer hardware manufacturers, software services suppliers, communications hardware suppliers, communications services suppliers, carrier providers, and regional Bell operating companies (RBOCs). Given this list, they were asked to state which type of vendor they would prefer to complete a project similar to the one discussed.

Over 50% of the respondents indicated a preference for software services suppliers even though, as noted earlier, many of the projects included a network component. Both computer hardware and communications hardware companies, by frequency at least, were a distant second. This tier was followed by a third tier of communications services providers including communications consultants, carriers, and the regional Bell companies.

The significant point to be understood from the results of this question is that buyers prefer software services companies who they perceive as able to handle the multifaceted aspects of a systems integration job as opposed to those vendors who are most noted for providing one or more components of that job.

The relatively poor showing of the RBOCs on this list suggests that Bell Atlantic, as a member of this class, is not recognized by buyers as being a preferred vendor for systems integration projects. For Bell Atlantic this further suggests that the company would have to work to establish itself as a recognized supplier of systems integration services. (Exhibits 10a and 10b.)

EXHIBIT 10a

PREFERENCE FOR CLASS OF VENDOR CLASS OF VENDOR

TARGET APPLICATION	Computer Hardware	Software Services	Comm. H/W	Comm. Services	Carrier	RBOC
ETN						1
Network			1			
Warehouse		1				
SDN			2		1	
ISDN						1
Banking Applic.	1		2			
V/D Integration				1		
Regionalize MIS Function	1					
Billing System		1				
Accounting Support	DK					
Student Information		1				
Lease Management Data Base		1				
Inventory Management		1				

Key: 1 = First Preference
2 = Second Preference

EXHIBIT 10b

PREFERENCE FOR CLASS OF VENDOR CLASS OF VENDOR

TARGET APPLICATION	Computer Hardware	Software Services	Comm. H/W	Comm. Services	Carrier	RBOC
Office Automation		1				
Data Communications Network		2			1	
Auto Crew Calling		1				
Data Center Consol-idation		1				
Data Base Management Installation		1				
Customer Information System		1				
Laboratory Information System		1				

Key: 1 = First Preference
2 = Second Preference

K

Long-Distance Carrier Contract Signer

It is of little surprise that in all instances the signer of the contract is the ultimate buyer, that is, the corporation sponsoring the systems integration project. In no instance was the vendor the signer acting on behalf of the buyer.

The indication in this question, and in several previous questions, is that the long-distance carrier decision has been and will continue to be within the province of the buyer organization. They make the decision, and they sign the contract. Vendors do not get directly involved in this process.

An open issue, however, is the extent to which the design of a network, as part of a systems integration project, influences that carrier decision. Data on that aspect of this overall issue was not a part of this particular assignment. (Exhibit 11).

EXHIBIT 11

LONG-DISTANCE CARRIER CONTRACT SIGNER

Frequency of Response	
Buyer	100%
Vendor	0%

L

Class of Vendor Preference by Communications Requirement

As indicated earlier, there is an overwhelming preference for software and services companies regardless of the network requirement for systems integration jobs. No clear vendor preference pattern is indicated in the data with respect to the use of communications-oriented vendors, given the network requirements of particular jobs.

It is interesting to note that software and services firms were not indicated as a preference for any job that involved a network. Preference in these cases went to communications-oriented suppliers, or, in two instances, a computer hardware supplier.

The indication is that buyers do make an association between network requirements and the capabilities of communications-oriented suppliers. This may bode well for Bell Atlantic as it explores the systems integration marketplace in that it provides the company with an image platform from which to launch its business. Bell Atlantic should not be satisfied, however, with focusing strictly on the network portion of the marketplace because a significant portion of the systems integration marketplace does not include a network requirement. (Exhibit 12.)

EXHIBIT 12

CLASS OF VENDOR PREFERENCE BY COMMUNICATIONS REQUIREMENT

Class	No Network #	Network Non–Inter-LATA #	Inter-LATA Development #	Inter-LATA In Place #
Computer Hardware		1	1	
Software Services	4		DK	7
Comm. H/W			1	
Comm. Services				1
Carriers			1	1
RBOCs	1	1		

M

Open Comments on Restrictions

As a final item, the issues surrounding the inter-LATA restrictions were briefly explained to the respondents. After this explanation was provided, respondents were asked for comments regarding the impact that these restrictions might have on their selection of a systems integration vendor to develop a project such as the one discussed. (It should be noted that this question was revised at the request of Bell Atlantic after several of the interviews had been completed.)

In those instances in which the network is the project and that network is inter-LATA, the buyer appears to be concerned about this restriction. For the remainder of the jobs, the buyer concern is not so much about the restriction as it is about the qualifications of the vendor.

Considering the low preference levels for RBOCs in general, it would appear again that a significant sales and marketing effort will be required on the part of Bell Atlantic to convince buyers of its capabilities. It is not the restriction as much as it is the perception of RBOCs in general that the buyer will respond to.

Open Comments On Restrictions

Expects vendor to be able to handle all phases of project, except what he keeps for himself.

"In a great way." It prevented WI Bell (BOC) from competing directly. BOC can't specify inter-LATA suppliers.

In their proposal, C&P gave scenarios for network based on each of the common carriers. Client made the interface selection based on the scenarios.

Would not concern us; we are now our own carrier.

Didn't think they (the RBOC) would be interested in this type of work.

We base our decision on qualifications.

Would not use an RBOC for a telecommunications network; the restrictions on the RBOC would be an issue.

It wouldn't—we only use microwave.

Since there is no long-distance involved, the restriction wouldn't matter to us.

Restriction would not, in and of itself, impact the selection. The RBOC would have to be in this type of business; even then, we'd look at our own network requirements and decide.

Would not impact, if they proved to be best for job.

Doubt if we would be inclined to use an RBOC to develop any project.

Most of the other respondents, including those we discarded from further SI analysis, had no reservations regarding vendor selection vis-a-vis this issue. Their reservations dealt with overall capabilities of the RBOCs.

PROJECT PROFILE

PROJECT: ETN INDUSTRY: State/Local Gov't

PRIME CONTRACTOR: C&P

DEVELOPMENT VALUE: $4 million TIME REQUIRED: 3 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Reduce overall long-distance cost (i.e., a savings value over time).
- Reduce costs on charge backs to state offices & agencies for use of long-distance (voice) services.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Expand existing Centrex hub by the addition of another Centrex hub in Clarksburg, West Virginia.
- Installation of 7 Centrex nodes throughout West Virginia to interface with the 2 Centrex hubs via star-type design.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE				
COMMUNICATIONS HARDWARE	T1's	all voice	C&P some AT&T	60%
SOFTWARE PACKAGES			C&P	20%
SERVICES a) COMMUNICATIONS ORIENTED		T-1 carrier services through AT&T	C&P	20%
b) INFORMATION ORIENTED				
TOTAL				100%

PROJECT PROFILE

PROJECT: Network INDUSTRY: Retail Distribution

PRIME CONTRACTOR: In-house/Micom

DEVELOPMENT VALUE: $6 million TIME REQUIRED: 36 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Reduce the cost of uploading financial information in retail chain stores from the over 350 local administrative offices throughout the U.S.
- Maintain better control over the data collection network.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Convert existing leased network for data collection to a satellite-based network (KU band).
- Install DEC VAX 11/780 as network controller while keeping existing SNA architecture.
- Install antenna dishes for data transmission at all administrative offices.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	DEC VAX 11/780		Company	5%
COMMUNICATIONS HARDWARE	350 antenna dishes from Micon		Micon	80%
SOFTWARE PACKAGES	For Dec VAX 10/S	package	Micon	5%
SERVICES a) COMMUNICATIONS ORIENTED	installation (subcontract to Satelease)		Company	10%
b) INFORMATION ORIENTED				
TOTAL				100%

PROJECT PROFILE

PROJECT: Warehouse of the Future INDUSTRY:Discrete Manufacturing

PRIME CONTRACTOR: Harnischfager

DEVELOPMENT VALUE: $ 7.5 million TIME REQUIRED: 36 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Company running a manual inventory system to ship $2.5M parts per year, amounting to over $0.5B revenue. Warehouse is approximately 60,000 sq.ft. Company saw growth in requirements for future with automation the only way to keep up with demand.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Design a warehouse of the future to accomodate future growth needs.
- Design and implement a computer system to assist in the tracking and locating of inventory and shipments.
- Design and implement a monorail system to transport parts around the warehouse.
- Integrate all materials handling systems.
- Alter building to accomodate planned warehouse.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	DEC 8550 (1)		Client	5%
	DEC 780 (2)		Harnischfager	15%
	DEC PDP-11 (6) workstations (60)			
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES	inventory management materials tracking	modified	Harnischfager	20%
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	consulting, project management, design, integration, documentation		Harnischfager	30.5%
OTHER	building preparation		Harnischfager	5%
	stacker		Harnischfager	20%
	monorail with 8 carriers		Harnischfager	3%
	conveyors		Harnischfager	5%
	AGV (2)		Harnischfager	1%
TOTAL				100%

PROJECT PROFILE

PROJECT: SDN INDUSTRY: Manufacturing

PRIME CONTRACTOR: AT&T

DEVELOPMENT VALUE: Proprietary

TIME REQUIRED: ongoing, system recently implemented, and final phases are in progress

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Needed a large access network—area covers large portion of the U.S.
- Main objective: to acquire a large access network with LCR capability. Company wanted an integration of data and voice.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

All aspects of the services provided by the 4ESS (about 35-40 benefits/applications)

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	4ESS AT&T Node		AT&T	in place
COMMUNCATIONS HARDWARE				
SOFTWARE PACKAGES	custom package			1%
SERVICES				
a) COMMUNICATIONS ORIENTED	configuration of existing network customized to fit own individual needs within capabilities of network (ex: billing)		AT&T	5%
b) INFORMATION ORIENTED	2 networks:			
	control network		AT&T	54%
	in-house		ourself	40%
TOTAL				100%

PROJECT PROFILE

PROJECT: ISDN INDUSTRY: Distribution

PRIME CONTRACTOR: Illinois Bell

DEVELOPMENT VALUE: $1 million + TIME REQUIRED: 9 months (started '83) (future—ongoing maintenance)

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Reduce telephone cost: combine voice data facsimile over the wiring plan.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- ISDN has architecture onto itself—all aspects of ISDN; coaxed hook-up PC modem pools/integration of facsimile (voice).

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE				
COMMUNICATIONS HARDWARE	existing switch		Illinois Bell purchased from AT&T	
SOFTWARE PACKAGES				
SERVICES				
a) COMMUNICATIONS ORIENTED			team: in-house with Illinois Bell/AT&T	20%
b) INFORMATION ORIENTED			See above	80%
TOTAL				100%

Company tied into Illinois Bell. Illinois Bell procured hardware/software from AT&T.

PROJECT PROFILE

PROJECT: Bank System Upgrade

INDUSTRY: Banking

PRIME CONTRACTOR: IBM

DEVELOPMENT VALUE: $20-30 million

TIME REQUIRED: 3+ years

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Rearchitecture (revamp) of entire system—old HW/systems changed over last 30 years. Integration of banking applications package (i.e., Hogan).

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Consulting.
- Coding.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE			IBM	50%
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES			IBM	20%
SERVICES				
a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	s/w coding, consulting		IBM IBM	30%
TOTAL				100%

PROJECT PROFILE

PROJECT: Voice/Data Integration INDUSTRY: State/Local Gov't

PRIME CONTRACTOR: AT&T

DEVELOPMENT VALUE: cost breakdown (over 10 years) TIME REQUIRED: 10 years

Fixed Development Costs	$ Millions
NMC	4.5
Network	27.5
Ongoing	168.0
	200.0

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Faced with sizeable long distance rate increases.
- The state needed new and different ways of handling its long-distance/telecommunications needs so as to be cost-effective in the long run.
- Improve the central management of its own network (e.g., network utilization, performance, problem resolution, equipment/facilities inventory).

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Creation of a network management center to some as the single point of contact for users of the state's voice and data networks, to be staffed around-the-clock by AT&T personnel.
- Install a backbone network that will tie together over 1000 state locations, driven by four AT&T System 85 tandem switches (one in each of the state's 4 LATAs).
- Convert from primarily analog to digital network.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE			AT&T	65%
COMMUNICATIONS HARDWARE			AT&T	
SOFTWARE PACKAGES			AT&T	7%
SERVICES				
a) COMMUNICATIONS ORIENTED	maintenance (15%) installation		AT&T	28%
b) INFORMATION ORIENTED	management s/w development			
TOTAL				100%

PROJECT PROFILE

PROJECT: Regionalize MIS Function INDUSTRY: Manufacturing

PRIME CONTRACTOR: Unknown, project out for bid

DEVELOPMENT VALUE: $3-5 million TIME REQUIRED: 24 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- In order to contain costs and attain maximum efficiency, they are consolidating 30 data centers into 4 regional data centers.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Design, plan the central data center buildings.
- Design the network for the data centers.
- Design the CPU and software requirements for the data centers.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	*			
COMMUNICATIONS HARDWARE	*			
SOFTWARE PACKAGES	*			
SERVICES				
a) COMMUNICATIONS ORIENTED	*			
b) INFORMATION ORIENTED	*			
TOTAL				100%

* This project is in the bidding phase; these components will be part of the final contract.

PROJECT PROFILE

PROJECT: Billing System INDUSTRY: Utilities

PRIME CONTRACTOR: EDS

DEVELOPMENT VALUE: $11 million TIME REQUIRED: 24 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Deregulation has necessitated a flexible pricing schedule.
- Current systems are technologically outdated; software is patched and difficult to modify.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Technical design of an integrated, flexible billing system.
- Implement the technical design and install software.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	IBM 3090 (2-3)		Client	55%
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES				
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Design, Development, Integration, Documentation, Consulting		EDS	45%
TOTAL				100%

PROJECT PROFILE

PROJECT: Accounting Support

INDUSTRY: Insurance

PRIME CONTRACTOR: Arthur Andersen

DEVELOPMENT VALUE: UNK

TIME REQUIRED: 42 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Need to integrate accounting and insurance functions at headquarters and local offices.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Design system.
- Select hardware.
- Develop software.
- Manage facility.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	IBM 3090 & 3093 at HQ Distributed DEC MicroVAX at local offices		Arthur Andersen	30%
COMMUNICATIONS HARDWARE	UNK			
SOFTWARE PACKAGES	Relational DBMS, vendors unknown		Arthur Andersen	10%
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Design, Select h/w, Develop s/w using AA&Co/ Workbench, FM		Arthur Andersen	60%
TOTAL				100%

PROJECT PROFILE

PROJECT: Student Information System INDUSTRY: Education

PRIME CONTRACTOR: Coopers & Lybrand

DEVELOPMENT VALUE: $10 million TIME REQUIRED: 36 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Replace "homegrown" financial aid system and proprietary student information system with modified software products based on Cullinet's IDMS/R.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Procure software package.
- Modify and implement packages.
- Consult on hardware selection.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	IBM 3090/MVS/XA		Client/C&L	40%
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES	Integrated Student Info. Systems from systems & computer technology		C&L C&L	10%
	Student aid management IDMS/R Sigma Corp.		C&L	
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Consulting, Hardware Selection, package mod. using C&L's proprietary Dev. Syst., which consists of a LAN of 18 ATs		C&L	50%
TOTAL				100%

PROJECT PROFILE

PROJECT: Lease Management Data Base INDUSTRY: Process Mfg.

PRIME CONTRACTOR: Big 8 Accounting Firm

DEVELOPMENT VALUE: $20 million+ TIME REQUIRED: 36+ months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Company recognized a need to have a data base that will accomodate and manage lease information, accounting changes, and be more technologically up-to-date than existing systems.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Procure lease management and related packages and make modifications to integrate them into a system and suit them to client's particular needs.
- Install and train client employees on system.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE				
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES	lease management data base product	modified	Big 8	*
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	consulting, project management, design/integration, training		Big 8	*
TOTAL				100%

*Respondent felt that this information was proprietary and would not reveal any details.

PROJECT PROFILE

PROJECT: Inventory Management INDUSTRY: Distribution

PRIME CONTRACTOR: Arthur Young

DEVELOPMENT VALUE: Proprietary TIME REQUIRED: 48+ months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- In order to stay competitive, company needed to manage inventory in a more efficient manner.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Design and develop a comprehensive inventory management system using AY proprietary structured engineering techniques.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	*			**
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES	*			**
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	consulting, project management design, integration, education/training, documentation			**
TOTAL				100%

* Amount of hardware and software packages to be determined during the design phase.

** Project is divided between AY and client personnel. It is too new to have definite ideas of expenses.

PROJECT PROFILE

PROJECT: Office Automation

INDUSTRY: Services

PRIME CONTRACTOR: Systemhouse

DEVELOPMENT VALUE: $1.2 million

TIME REQUIRED: 17 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Aircraft Owners & Pilots Association (AOPA) represents the interests of general aviation, pilots, and aircraft owners through such services as publications, newsletters, annual meetings, etc. Most of the services and administrative tasks are still manual, slowing down productivity.
- Need to further and better automate existing business, including a distributed data base that is maintainable by the accounting staff.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Install a LAN.
- Modify Salomon-3 Accounting System to function as a data base to be run on IBM 4361.
- Procurement of PCs where none existed.
- Complete system support and training.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	PCs, IBM 4361		Client	10%
COMMUNICATIONS HARDWARE	LAN (Novell)		Systemhouse	5%
SOFTWARE PACKAGES	Modified package: Salomon-3 Accounting System; 25% package 75% custom		Systemhouse	40%
SERVICES				
a) COMMUNICATIONS ORIENTED	creation of LAN		Systemhouse	45%
b) INFORMATION ORIENTED	design/ integration, training of staff			
TOTAL				100%

PROJECT PROFILE

PROJECT: Data Comm. Network INDUSTRY: State/Local Gov't

PRIME CONTRACTOR: Boeing Computer Services

DEVELOPMENT VALUE: $23 million TIME REQUIRED: 72 Months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Enable several individual state-wide agency networks to effectively communicate with each other for the sharing of data.
- Provide state information workers with a single, statewide network for accessing the Commonwealth's information data bases.
- Design such a network while reducing cost of data transmission.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Create a Network Control Center to serve as focal point for statewide network.
- Organize an Integrated Control System (ICS) designed to provide an agencywide data base for storing administrative records (eg, accounting, purchasing, personnel, payroll).
- Redesign network and communications circuits to increase transmission speeds in order to cut down on data transmission costs, while supporting some 3,200 terminals, printers, and other addressable devices operating under IBM SDLC and BSC and Sperry Uniscope protocols.
- Procure protocol converters to help improve response time and increase user productivity.
- Provide on-site maintenance per annual renewable contract.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	UNK		BCS	50%
COMMUNICATIONS HARDWARE	protocol converters, T-PADS modems, host pads, T-1 Links, cluster controllers	IBM SDLC	BCS	
SOFTWARE PACKAGES	UNK		BCS	UNK
a) COMMUNICATIONS ORIENTED	Vendor personnel assigned on full time basis: Track network use, cost detect and investigate failures failures			
	In-depth training of employees		BCS	50%
b) INFORMATION ORIENTED	project management, design/ integration		BCS	
TOTAL				100%

PROJECT PROFILE

PROJECT: Auto Crew Calling INDUSTRY: Transportation

PRIME CONTRACTOR:Company in joint venture with PST (of Denver, CO)

DEVELOPMENT VALUE: $0.5 million TIME REQUIRED: 24 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Railroad was struggling with a decentralized, manual crew-calling system (a system for scheduling and assigning crew members to particular freight trains for particular runs).
- The manual, decentralized system was laiden with problems including errors in scheduling employees, failing to call employees who were supposed to be assigned (but who still collected for the work they didn't do, via claims filed for not being contacted).
- Excess overhead (e.g., railroad clerks).
- Required an automated centralized crew-calling system that would incorporate the different labor rules for the various railroads in addition to performing the basic scheduling and assigning functions.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Customize and modify existing centralized, automated crew-calling system from PST, to later be marketed as a turnkey system by PST.
- Installation of 12 terminals at central HQ in Chicago into existing IBM 3083.
- Automated system eventually to be linked to payroll.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	12 terminals (CRTs)		Client	2%
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES	conversion work	modified package	25% Client 75% PST	80%
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Modification/ Customization of application s/w		PST	10%
TOTAL				100%

PROJECT PROFILE

PROJECT: Data Center Consolidation INDUSTRY: Manufacturing

PRIME CONTRACTOR: Computer Task Group

DEVELOPMENT VALUE: $25 million TIME REQUIRED: 24 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- A partnership was set up between two steel companies to consolidate their sales efforts and data center operations.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Mirgrate all of the programs from the current centers to the new central location.
- Redesign all of the unique and unsupported programs using TRANSFORM and CORTEX (standard program generator systems) that have been in operation at the data centers.
- Redesign the production control system.
- Provide facilities management services.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE				
COMMUNICATIONS HARDWARE				
SOFTWARE PACKAGES				
SERVICES				
a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Using TRANSFORM, CORTEX—redesign, convert current code; provide consulting, project management, design integration, education/ training, documentation		CTG	36%
	Operation/maintenance of system			64%
TOTAL				100%

PROJECT PROFILE

PROJECT: DBMS Installation INDUSTRY: Process Mfg.

PRIME CONTRACTOR: Arthur Andersen

DEVELOPMENT VALUE: $10 million TIME REQUIRED: 48 months

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Company has outgrown its existing data base and is seeking a new, more powerful data base that will enable the company to make better management decisions.
- In addition, management decisions must incorporate up-to-date information on capacity planning, contract materials planning, and scheduling.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- Install and modify Arthur Andersen's MAC-PAC software.
- Provide consulting, analytical and programming staff.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE				
COMMUNICATIONS HARDWARE	200 data terminals, cable		Client	5%
SOFTWARE PACKAGES	MAC-PAC	modified package	Arthur Andersen	20%
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Consulting, Analytical, Programmers		Arthur Andersen	75%
TOTAL				100%

PROJECT PROFILE

PROJECT: System 90 INDUSTRY: Banking

PRIME CONTRACTOR: EDS

DEVELOPMENT VALUE: $50 million TIME REQUIRED: 5 years

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Development of a customer information system, primarily for better tracking of loans and deposits.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- EDS will write code.
- Define functions.
- Interface with O/S.
- Implementation of 5th generation software.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	IBM 300		Client	*
COMMUNICATIONS HARDWARE	IBM 3270 equivalent 602 interface, PCs		Client	*
SOFTWARE PACKAGES				
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Network design, selection implementation, consulting, project management, design/integration, education/training, documentation, operation/maintenance	custom	EDS	*
TOTAL				100%

* Project in the design phase; quantity and expenses uncertain at this time.

PROJECT PROFILE

PROJECT: Hybrid Group Solution

INDUSTRY: Health Care/Hospital

PRIME CONTRACTOR: Labforce

DEVELOPMENT VALUE: $2 million

TIME REQUIRED: 3 years

BUSINESS PROBLEM/PROJECT OBJECTIVES:

- Process, track, and contact patient tests done in a network environment with 25 hospitals.

SERVICES TO BE PROVIDED/TECHNOLOGIES EMPLOYED:

- PC based intelligent instrument resulting.
- PC anantomic pathology system.
- Hybrid accounting system.
- Blood bank system.

COMPONENT	DESCRIPTION(#)	FORMAT	SOURCE	EXP.
COMPUTER HARDWARE	PRIME 6350 PCs at 9 hospitals			55%
COMMUNICATIONS HARDWARE	Codex data communications network at 9 hospitals			
SOFTWARE PACKAGES	Western Star: Blood Bank, Intelligent Instruments: Anatomic Pathology System, Hybrid Accounting System			10%
SERVICES a) COMMUNICATIONS ORIENTED				
b) INFORMATION ORIENTED	Consulting/Integration Education/Training			35%
TOTAL				100%